

REMARKS

Claims 1, 21, 25, and 28-30 were pending in the subject application. The Examiner has rejected all pending claims and has objected to claims 1 and 21. In an effort to expedite the prosecution of the subject application and without conceding as to the substance of the rejections, Applicant is amending claims 1, 21, and 25. Applicant has also added new claim 31. Support the amendments can be found at, for example, paragraph nos. 22, 33, and 35 of the subject application as filed. No new matter has been added. Applicant respectfully requests reconsideration of the subject application in view of the amendments and the following remarks.

Claim Objections

The Examiner has objected to claims 1 and 21 in view of certain informalities. Applicant has amended claims 1 and 21 to address the Examiner's objections, and respectfully requests withdrawal of the objections.

Claim Rejections – 35 U.S.C. §103

The Examiner has rejected the claims as allegedly unpatentable over Giemborek (US 6,950,105) in view of Williams (US 6,397,343), Oliver (US 7,243,217), and Culbert (US 6,820,209). Applicant respectfully traverses these rejections for the reasons below.

Claim 1 specifies: (1) “detecting a percentage of clock cycles for which a downstream stage of the graphics pipeline is held up waiting for data inputs from an upstream stage of the graphics pipeline as an indicator of utilization ..., wherein each of the downstream stage and the upstream stage of the graphics pipeline operates in accordance with the clock rate in the graphics processor core clock domain;” and (2) “increasing the performance level in response to detecting an over-utilization condition in order to increase the clock rate in the graphics processor core clock domain and decreasing the performance level in response to detecting an under-utilization condition to decrease the clock rate in the graphics processor core clock domain.”

The Examiner concedes that Giemborek and Williams fail to disclose features related to a percentage of clock cycles for which a downstream stage of a graphics pipeline is held up waiting for data inputs from an upstream stage of the graphics pipeline as an indicator of utilization. The Examiner relies upon Oliver as allegedly curing the deficiencies of Giemborek

and Williams and, in particular, points to the adjustment of clock speed in Oliver's floating point unit 120 (or FPU 120) if Oliver's integer unit 110 is waiting for a result from FPU 120. However, Oliver makes clear that integer unit 110 and FPU 120 operate in accordance with clock speeds that are decoupled from each other. *See, e.g.*, Oliver, col. 4, line 65 to col. 5, line 1 ("The present invention *decouples* the clock speed of integer unit 110 and FPU 120 using command and data queues (or reservation stations) in dispatch unit 123 and control logic in execution pipeline clock controller 205.") (emphasis added). In contrast, claim 1 specifies that "each of the downstream stage and the upstream stage of the graphics pipeline operates in accordance with the clock rate in the graphics processor core clock domain." As such, and in accordance with claim 1, an increase (or a decrease) in the clock rate would apply to both the downstream stage and the upstream stage of the graphics pipeline, rather than having clock speeds decoupled in the manner contemplated by Oliver. The deficiencies of Giemborek, Williams, and Oliver are not remedied by the disclosure of the remaining cited reference.

For at least these reasons, claim 1 and its dependent claim 28 define subject matter that is not taught or suggested by the cited references, and are in a condition for allowance.

Claims 21 and 25 include features similar to those discussed with reference to claim 1. Therefore, claims 21 and 25 and their dependent claims 29-31 also are in a condition for allowance.

CONCLUSION


In view of the foregoing, Applicant respectfully submits that no further impediments exist to the allowance of this application and, therefore, requests an indication of allowability. However, the Examiner is requested to call the undersigned if any questions or comments arise.

The Director is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 50-1283.

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